

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1, 2, 4-9 and 12-15 are pending in the present application. Claims 3, 10 and 11 have been canceled and Claims 1, 5, 6, 9 and 12 have been amended by the present amendment.

In the outstanding Office Action, Claim 3 was rejected under 35 U.S.C. § 112, second paragraph; Claims 1-4, 6 and 7 were rejected under 35 U.S.C. § 102(a) as anticipated by Morozumi (U.S. Patent 6,559,545); Claims 9, 10 and 12-14 were rejected under 35 U.S.C. § 102(a) as anticipated by Morozumi; and Claims 5, 8, 11 and 15 were indicated as allowable if rewritten in independent form.

The abstract has been amended to remove the reference numbers. No new matter is added thereby.

With regard to the rejection under 35 U.S.C. § 112, second paragraph, Claim 1 has been amended to include the subject matter of Claim 3 with the feature "... reaches ..." being amended to recite as "... a bottom surface thereof contacts said interlayer insulating film through said copper metal" to clarify the subject matter, and amended Claim 1 finds support in Figure 11, for example. Accordingly, it is respectfully requested this rejection be withdrawn.

Applicants thank the Examiner for the indication that Claims 5, 8, 11 and 15 include allowable subject matter. In light of that indication, Claim 5 has been rewritten in independent form including the subject matter of base Claim 1. Further, Claim 9 has been amended to include the allowable subject matters of Claim 11 and intervening Claim 10, and Claims 10 and 11 has been canceled. Therefore, Claims 5 and 9 are believed to be allowable.

Claim 6 has been amended and finds support in Figure 19, for example. Claim 12 has been amended for clarification. No new matter is added thereby.

Claims 1, 2, 4, 6 and 7 stand rejected under 35 U.S.C. § 102(a) as anticipated by Morozumi. This rejection is respectfully traversed.

Amended Claim 1 is directed to a semiconductor device that includes *inter alia* aluminum alloy being partially buried in a copper metal and a bottom surface thereof contacting an interlayer insulating film through the copper metal.

In a non-limiting example, Figure 11 illustrates aluminum alloy 17 partially buried in a copper metal 16a and a bottom surface thereof contacting an interlayer insulating film 14 through the copper metal 16a (see also specification, page 12, line 15 to, page 13, line 11).

In contrast, Morozumi discloses the bonding pad section 80 that includes the first conduction layer 82 and the second conduction layer 84 (see column 8, lines 18-27, and Figure 5). Moreover, Morozumi discloses that the second conduction layer 84 is formed from a material different from that of the first conduction layer 82 and when a copper-base material is used for the uppermost wiring layer 62, aluminum-base material or gold base material may be used for the second conduction layer 84 (see column 8, lines 44-56, and Figure 5). However, as shown in Figure 5 of Morozumi, the second conduction layer 84 does not contact an interlayer film (20, 22) through the first conduction layer 82.

Further, amended Claim 6 is directed to a semiconductor device that includes *inter alia* a pad area including copper metal integrated with copper interconnect line, and aluminum alloy contacting the copper metal. The aluminum alloy is at least partially buried not in the copper metal but in the interlayer insulating film.

In a non-limiting example, Figure 19 shows a pad area 30 including copper metal 16a and aluminum alloy 17 at least partially buried not in the copper metal 16a but in the interlayer insulating film 14.

Since the aluminum alloy is not buried inside the copper metal, it is possible to prevent an exposure of the copper metal caused by the wire bonding step (see specification, page 14, line 23 to, page 15, line 4).

In contrast, as shown in Figure 4 of Morozumi, the aluminum alloy 84 is in the copper metal 82, and not in the interlayer insulating film 22. Therefore, it is respectfully submitted that Morozumi does not prevent the above exposure of the copper metal.

Accordingly, it is respectfully submitted that independent Claims 1 and 6 and each of the claims depending therefrom define over Morozumi.

Claims 12-14 stand rejected under 35 U.S.C. § 102(a) as anticipated by Morozumi. This rejection is respectfully traversed.

Amended Claim 12 is directed to a method of manufacturing a semiconductor device that includes (a) forming a copper interconnect line in an interlayer insulating film (e.g., Figures 12-14), (b) after the step (a), defining an opening which is in contact with the copper buried interconnect line in the interlayer insulating film (e.g., Figure 15), (c) depositing aluminum alloy in the opening (e.g., Figure 16), and (d) removing excess aluminum alloy to form a pad area including the aluminum alloy (e.g., Figure 17).

By providing such a method of manufacturing a semiconductor device, it is possible to form a pad area that includes aluminum alloy contacting an interlayer insulating film such as shown in Figures 11, 18 and 19, for example, and also possible to prevent an exposure of the copper metal caused by the wire bonding step (see specification, page 13, lines 2-11).

In contrast, Morozumi describes forming of the recess 62a for the interconnect line in the interlayer insulating film 22 and the recess 80a for the pad section *at the same time*, and then the copper and the aluminum alloy are successively deposited (see also Figures 1-5). Thus, the copper metal 82 surrounds the aluminum alloy 84 in the pad section 80, and the aluminum alloy 84 does not contact the interlayer insulating film 22.

Accordingly, it is respectfully submitted that independent Claim 12 and each of the claims depending therefrom define over Morozumi.

Consequently, in light of the prior indication of allowable subject matter and above discussions, and in view of the present amendments, Applicants respectfully submit that the present application is in condition for allowance, and an early action favorable to that effect is earnestly solicited.

Respectfully submitted,

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